S–3259

Sub. Code
23MZO1C1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Zoology

STRUCTURE AND FUNCTION OF INVERTEBRATES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions

1. What is taxonomy?
2. Carolus Linnaeus.
3. Define – Pseudocoelom.
4. What is Deuterostomia?
5. What is Trachea?
6. Define – Heamocyanin.
7. What is coelomoducts?
8. Define – Nephridia.
9. Define – Alima larva.
10. What are Phoronids?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the outline classification of animals.

Or

(b) Write about the International code of Zoological nomenclature.

12. (a) Explain the organization of coelom.

Or

(b) Describe the ciliary movement in protozoa.

13. (a) Write shortly about the patterns of feeding in lower metazoan animals.

Or

(b) Briefly explain the mechanism of respiration in molluscs.

14. (a) Classify the excretory organs in invertebrates.

Or

(b) Explain the primitive nervous system of invertebrates.

15. (a) Write notes on larval forms of parasites.

Or

(b) Write an account on Rotifera of Minor phyla.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the various new trends of taxonomy.

17. Compare the hydrostatic movements of annelid and echinodermata.

18. Give an account on respiratory pigments of animals.

19. Write an essay on trends in neural evolution.

20. Give an account on larval forms of free living invertebrates.

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S–3260

Sub. Code
23MZO1C2

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Zoology

COMPARATIVE ANATOMY OF VERTEBRATES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Atriopore.
2. Proboscis glands.
3. Ebidermal glands.
4. Horns.
5. Swim bladder.
6. Truncus ateriosus.
7. Pectoral girdle.
8. Mesonephros.
9. Taste buds
10. Synapse.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Briefly explain the concept of Protocordata.

Or

(b) Enumerate the importance of Vertebrate morphological studies.

12. (a) Describe the general structure and functions of feathers and hairs of Vertebrates.

Or

(b) Give a comparative account on the glands and scales of Vertebrates.

13. (a) Briefly explain the modifications of aortic arches in Vertebrates.

Or

(b) Give an account on internal and external respiration.

14. (a) Compare the girdles and limbs of Amphibia and Reptilia.

Or

(b) Briefly explain the different types of kidneys in Vertebrates.

15. (a) Write an account on organs of olfaction in Vertebrates.

Or

(b) Discuss the cranial nerves of Fishes and Amphibia.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on origin of Vertebrates.

17. Explain the classification of Vertebrates up to classes mentioning the important characters and examples of each class.

18. Describe the evolution of heart in Vertebrates.

19. Write a detailed account on different types of jaws suspensorium in Vertebrates.

20. Write a comparative anatomy of brain of Vertebrates in relation to its functions.

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S–3261	Sub. Code
	23MZO1E1

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Zoology

Elective – MOLECULES AND THEIR INTERACTION RELEVANT TO BIOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define pH

2. Define Reaction Kinetics.

3. What is hydrophobic interaction?

4. Define Glycogenesis.

5. What are Isozymes?

6. State coupled reaction.

7. Define B DNA.

8. What are Motifs?

9. State hydrogen bond

10. Define covalent bond.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Explain the structure of atoms and molecules.

Or

(b) Give an account on ionic bond with suitable examples.

12. (a) Classify monosaccharides with suitable examples.

Or

(b) Highlight Vander Waals interaction.

13. (a) Write about the bioenergetics of Glycolysis.

Or

(b) Give an account on the principles of catalysis.

14. (a) Write about Ramachandran Plot.

Or

(b) Analyze protein folds.

15. (a) Explain disulfide linkage with suitable examples.

Or

(b) Write about hydrophobic interaction.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain mechanism of buffer action and its significance in biology.

17. Describe β oxidation theory of fatty acid metabolism.

18. Elaborate mechanism of enzyme catalysis.

19. Discuss secondary structure of protein with suitable examples.

20. Write an essay on stability of nucleic acid.

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S–3262

Sub. Code
23MZO1E2

M.Sc. DEGREE EXAMINATION, APRIL 2024.

First Semester

Zoology

Elective – BIOSTATISTICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Census
2. Pictograms
3. Range
4. Mode
5. Poisson distribution
6. Gaussian curve
7. Rank correlation
8. Scatter diagram
9. SPSS
10. MANOVA

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Give a short account on tabulation.

Or

(b) Construct bar diagram frequency for the following data.

Weight of six fishes	*Labeo rohita*	*Cirrhinus mirgala*	*Catla catla*	*Cyprinus carpio*	*Tor tor*	*Wallago attu*
Body mean weight kg	1.25	2.10	2.33	1.12	3.4	3.85

12. (a) Find the mean for the following data

Weight of fishes (x)	10-20	20-30	30-40	40-50	50-60
Number of fishes (f)	15	17	16	19	13

Or

(b) The length $(X \pm SD$ inCms$)$ of two species of fish. A and B are as follows. Comment on the variability of the length in the two species.

Species A = 67 ± 2.5

Species B = 64 ± 2.4

13. (a) A box contains 4 white. 3 red and 2 black marbles. What is he probability of drawing a white or a red marble.

Or

(b) Write the characteristic features of Normal distribution.

14. (a) Discuss the steps involved hypothesis testing and write its applications.

Or

(b) What is regression analysis'? Explain the regression equation and its applications.

15. (a) Discuss the icons that appear on the SPSS screen.

Or

(b) Enlist the application of statistical packages.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Give an account variable its types and construction for a data.

17. Haemoglobin level of 15 female patients (gm/100ml) of blood is given below. Calculate measures of central tendency.

9.1 10.0 9.8 9.2 12.4 6.7 7.4 11.6

11.4 8.4 8.2 7.3 10.5 9.2 9.8

18. In a cage. 6 white rabbits and 9 black rabbits were there. What is probability of getting 2 black rabbits or 2 white rabbits.

19. A pharmaceutical company develops a drug, which it claims to increase hemoglobin content in aged people. The hemoglobin content (g/100 ml) of 10 subjects is measured before and after administration of the drug. On the basis of the following data, determine whether the company claim is valid. (Table value : 1.833).

Subject	1	2	3	4	5	6	7	8	9	10
Before	10	9	11	12	8	7	12	18	10	9
After	12	11	13	14	9	10	12	14	11	12

20. Define ANOVA. Write its types and steps and applications.

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S–3263

Sub. Code
23MZO1S1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Zoology

INTELLECTUAL PROPERTY RIGHTS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions

1. Name two types of intellectual property protection for creative works.
2. Explain the primary mission of WIPO.
3. Define "trade secret" as per the Indian legal framework.
4. What is the significance of registering a trademark in India?
5. What does TRIPS stand for?
6. What does "patent pending" mean?
7. Describe the concept of "intellectual capital" in the context of digital innovations.
8. How does false advertising contribute to unfair competition in IP?
9. Define intellectual property infringement.
10. Describe the role of genetic engineering in the emerging issues of IPRs.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the concept of IPRs in zoology. Provide an example of a zoological invention that can be protected by a patent.

Or

(b) Describe the significance of copyright in zoology research. Give an example of a situation where copyright may apply.

12. (a) How do trade secrets relate to zoology? Provide an example of a trade secret in the field of zoology.

Or

(b) Discuss the significance of priority claims in international industrial design registration.

13. (a) Identify the challenges and opportunities TRIPS presents to developing countries.

Or

(b) Highlight the advantages and potential challenges of using the PCT system for international patent protection.

14. (a) Explain the concept of "prior art" in patent law.

Or

(b) Provide a brief overview of a specific IP law case study.

15. (a) Explain the core elements and types of intellectual property that can be infringed, such as patents, Copyrights, and trademarks.

Or

(b) What are the key enforcement measures for protecting intellectual property rights?

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the role of patents and IPR in the development and distribution of pharmaceuticals and vaccines.

17. Provide examples of scientific discoveries or inventions that were initially kept as trade secrets before becoming public knowledge. Analyze the advantages and disadvantages of this approach.

18. How does the Patent Cooperation Treaty facilitate the international protection of biotechnological inventions, and what are the key considerations when filing PCT applications in the field of biology?

19. Examine the concept of open source software and how it has contributed to knowledge commons. Discuss the benefits and challenges of open source development.

20. Describe the concept of biopiracy in the context of IPR in biology. Provide a case study illustrating an instance of biopiracy involving the misappropriation of indigenous knowledge or genetic resources.

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S–3264

Sub. Code
23MZO1A1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Zoology

SERICULTURE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Tasar silk
2. CSB
3. Powdery Mildew
4. Pruning
5. Univoltine
6. Diapause
7. Chandrika
8. Uzi Fly
9. Flossy Cocoons
10. Re – Reeling

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write down the properties and importance of silk fibre.

Or

(b) Write note on Tasar silkworm.

12. (a) Briefly explain the varieties of mulberry plant

Or

(b) Write short note on fungal diseases of mulberry plant.

13. (a) Give an account on the silk gland of silkworm.

Or

(b) Explain the digestive system of silkworm.

14. (a) Write short note on chawki rearing.

Or

(b) Write down the symptoms and control measures of disease caused by uzifly in silkworm.

15. (a) Comment on the By – products of sericulture.

Or

(b) How will you identify and manage defective cocoons.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the History and advantages of sericulture in India.

17. Explain the vegetative methods of propogation of mulberry plant.

18. Explain the life cycle of Bombyx mori.

19. Explain the bacterial diseases of Bombyx mori

20. Write an account on cocoon boiling and deflossing.

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S–3265

Sub. Code
23MZO2C1

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Second Semester

Zoology

CELLULAR AND MOLECULAR BIOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Deutroplasm
2. Thylakoids
3. Heterochromatin
4. RER
5. tRNA
6. Cyclins
7. G-protein receptor
8. Cyclic AMP
9. Caspases
10. p53

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Distinguish between prokaryotes and eukaryotes.

Or

(b) Write a short note on role of lysosomes in cell pathology.

12. (a) Describe the ultra structure and function of the golgi complex.

Or

(b) Illustrate the mechanism of electron transport chain.

13. (a) Give an comparative account of mitosis and meiosis.

Or

(b) Make a note on synaptonemal complex.

14. (a) Describe the process of DNA replication.

Or

(b) Elucidate the G-protein coupled receptor mechanism action.

15. (a) Explain the various therapeutic measures used to prevent cancer.

Or

(b) Compare and contrast the properties of normal and a cancer cell.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Give a detail account on cell shape and size with suitable examples.

17. Elucidate the structure and function of mitochondria.

18. Explain the different steps involved in the formation of protein from DNA.

19. Detailed account on signaling mechanism and role of basement membrane in mammary gland tissue differentiation.

20. Describe the apoptosis is extensively studied in *C. elegans*.

S–3266

Sub. Code
23MZO2C2

M.Sc. DEGREE EXAMINATION, APRIL 2024

Zoology

DEVELOPMENTAL BIOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

Answer the following :

1. Acrosomes
2. Cell determination
3. Segmentation gene
4. Apoptosis
5. Capacitation.
6. Gray crescent
7. Epigenesis
8. Hox gene
9. Neural crest cells
10. Spina bifida

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain polyspermy and egg activation.

Or

(b) Compare and contrast the oogenesis in insect and amphibian.

12. (a) Give an account on rearrangement of egg cytoplasm.

Or

(b) Describe the sperm maturation and capacitation in mammals.

13. (a) Explain the mechanism of cleavage and mid blastula transition.

Or

(b) How does formation primary germ layer?

14. (a) Describe the genetic control of segmentation.

Or

(b) Write a short note on maternal effect of gene.

15. (a) Detail note on endocrine control of moulting and growth in insects.

Or

(b) Define regeneration. Explain the types of planaria regeneration.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the composition and synthesis of yolk in invertebrate.

17. Give a detail account on anatomical and behavioural adaptation brings the egg and sperm together.

18. Describe the factor affecting gastrulation in Aves and mammals.

19. Write an essay on molecular mechanism of left-right axis formation.

20. Illustrate the hormonal regulation in ovarian and vaginal cycle.

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S–3267

Sub. Code
23MZO2E1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Zoology

***Elective* — ECONOMIC ENTOMOLOGY**

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Glue peg

2. Hymenoptera and Lepidoptera

3. Strain types of lacs.

4. Ommatidia

5. Economic Injury Level.

6. *Pyrilla perpusilla*

7. Pest management

8. Pest risk analysis

9. Insect virus vectors

10. Trombiculid mites.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Outline the classification of insects.

Or

(b) Give an account on overview of insects and insect taxonomy.

12. (a) Brief about the types of honey bees.

Or

(b) Draw a neat diagram on the lifecycle of silkworm.

13. (a) Write about the biology of pests affecting coconut.

Or

(b) Brief about the categories of pests with examples.

14. (a) Explain about the importance of pest management.

Or

(b) Write a short note on merits and demerits of methods in pest control.

15. (a) Brief a note on vectors biology.

Or

(b) Mention the control measures of vectors.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss about the biological success of insects.

17. Elucidate in detail about the lac insects and cultivation.

18. Enumerate an account on bionomics and management of insects' pest in the cotton.

19. Elaborate about the concepts and practice of IPM.

20. Explain about the vectors of veterinary and mention its control measures.

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S–3268

Sub. Code
23MZO2E2

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Zoology

Elective — RESEARCH METHODOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. pH meter
2. PMT
3. Xylene
4. Gen bank
5. Objective lens
6. Resolution
7. Stationary phase
8. Southern blotting
9. Isotopes
10. Adherent cells

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the principle and functioning of the pH meter.

Or

(b) Define GLP. Explain the objectives of GLP.

12. (a) Give an account on histochemistry and its application.

Or

(b) Describe the steps involved in tissue fixation during histological processing.

13. (a) Give a brief account on working principle of light microscopy.

Or

(b) Distinguish between bright field and fluorescence microscopy.

14. (a) Explain the process and importance of southern blotting.

Or

(b) Make a note on process of thin layer chromatography.

15. (a) Define cell culture. Explain the different types of cell cultures.

Or

(b) Write a shot note on isotopes properties and its applications.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Give a brief account on working principle and process of spectrophotometry.

17. Describe the process, principle and advantage of electron microscopy.

18. What is microscopy? Describe types and applications of microscopy.

19. Describe the types and applications of chromatography.

20. Explain the sources of cell culture contamination and preventive measures.

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S–3269

Sub. Code
23MZO2S1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Zoology

POULTRY FARMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Slatted Floor System.
2. Table breed.
3. Grower birds.
4. Covered risks in poultry insurance.
5. Oyster-shell.
6. Circular feeders.
7. Marek's disease.
8. Intraocular route.
9. Vent sexing.
10. Artificial brooding methods.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss the present status of poultry farming in Tamilnadu.

Or

(b) Explain the floor space and feeder space requirement for different age of birds.

12. (a) Describe the artificial brooding methods routinely followed in poultry.

Or

(b) List out the important points to be considered during layer management.

13. (a) Describe the importance of feed supplement and additives in poultry.

Or

(b) List out essential vitamins, minerals and amino acids must present in the poultry feed.

14. (a) Write the symptoms and treatment options for coccidiosis.

Or

(b) Layout vaccination schedule for Broiler and layer breeders.

15. (a) Explain the criteria used for selection and grading of good quality eggs.

Or

(b) List out poultry waste products and explain the composting method of recycling.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the characteristics of deep litter poultry housing system.

17. Discuss the ideal management conditions for broilers and illustrate the score card for judging of broilers.

18. Define FCR and explain the necessary feed ingredients for different stages of layers.

19. Describe the symptoms, treatment and prevention methods for Ranikhet disease and chicken cholera.

20. Discuss the nutritional value of the egg and mention the hatching practices followed in poultry.

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S–3270

Sub. Code
23MZO2A1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Zoology

APICULTURE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Foraging.
2. Bee stings.
3. Pot hive.
4. Queen excluder.
5. Brood mite.
6. Sac-brood disease.
7. Propolis.
8. KVI sector.
9. Women for Bees.
10. NABARD.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write how honeybees organize their colony.

Or

(b) Describe the life cycle of rock honey bee.

12. (a) List out the factors that affect the hive while practicing apiculture.

Or

(b) Write the criteria for site selection for apiculture.

13. (a) How abiotic natural cause affects the hive colony-Explain.

Or

(b) Elucidate the symptoms of bee poisoning.

14. (a) Explain the chemical composition, extraction and uses of honey.

Or

(b) Discuss the pricing and marketing strategies followed in sales of bee products.

15. (a) Write the cost and profit analysis of honeybee farming.

Or

(b) Justify the government support in the form of loans and subsidies to honeybee farming.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the social behaviour patterns of the honeybee within the hive.

17. Layouts the sketches for Newton hive and explain the parts and advantages over other hives.

18. Write the causative agent, symptoms and control measures for Nosema disease and European foul board disease.

19. Explain the composition, extraction and uses of bee venom.

20. Describe the organization setup of Central Bee Research Institute and highlight its research and training to farmers.

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